

What is claimed is:

1. A quantum-well semiconductor device that senses radiation energy, comprising:

5 a substrate of a substantially transparent semiconductor material; and

a plurality of quantum-well structures, arranged in columnar shapes, and spatially separated from one another by a gap which is electrically insulating, said plurality formed
10 over said substrate to form a periodic array,

wherein each quantum-well column includes, a first conductive contact layer formed over said substrate, a quantum-well stack having a plurality of alternating quantum-well layers formed in parallel over said first conductive
15 contact layer and operating to absorb radiation polarized perpendicularly to said quantum-well layers, and a second conductive contact layer formed over said quantum-well stack.